



Digital Attenuator, 30 dB, 4 Bit DC–2 GHz

AT-232

Features

- Attenuation 2 dB Steps to 30 dB
- Temperature Stability ± 0.18 dB from -55°C to $+85^{\circ}\text{C}$ Typical
- Ultra Low DC Power Consumption
- Hermetic Surface Mount Package
- Fast Switching Speed, 12 ns Typical

Guaranteed Specifications¹ (From -55°C to $+85^{\circ}\text{C}$)

Frequency Range	DC – 2.0 GHz
Nominal Attenuation ²	2 dB Steps to 30 dB
Attenuation Accuracy	DC – 2.0 GHz
Any Single Bit	± 0.1 dB +3% of Attenuation Setting in dB
Any Combination of Bits	± 0.2 dB +4% of Attenuation Setting in dB

VSWR	DC – 2.0 GHz	1.6:1 Max
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Reference Insertion Loss	DC – 2.0 GHz	2.5 dB Max
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Operating Characteristics

Impedance	50 Ohms Nominal
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Switching Characteristics	
Trise, Tfall (10% to 90%)	12 ns Typ
Ton, Toff (50% CTL to 90%/10%)	18 ns Typ
Transients (In-Band)	25 mV Typ

Input Power for 1 dB Compression	0.05 GHz	+20 dBm Typ
	0.5 GHz to 3 GHz	+28 dBm Min

Intermodulation Intercept point (for two-tone input power up to +5 dBm)			
Intercept Points	IP2	IP3	
0.05 GHz	+45	+40	dBm Typ
0.5 GHz to 3.0 GHz	+68	+50	dBm Typ

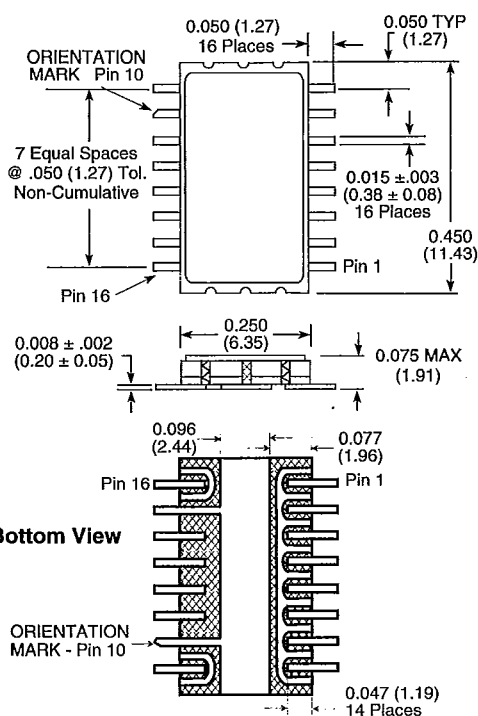
Control Voltage (Complementary Logic)	
Vin Low	0 to -0.2V @ $20\text{ }\mu\text{A}$ Max
Vin High	-5V @ $10\text{ }\mu\text{A}$ Typ to -8V @ $200\text{ }\mu\text{A}$ Max

1. All specifications apply when operated with a 50 ohm impedance at both RF ports.
2. Above reference insertion loss.
3. Contact the factory for standard or custom screening requirements.

Ordering Information

Model No.	Package
AT-232 PIN	Surface Mount

CR-6



Specifications Subject to Change Without Notice

M/A-COM Inc. ■ 1011 Pawtucket Boulevard, Lowell, MA 01853 USA

■ Telephone: 800-366-2266

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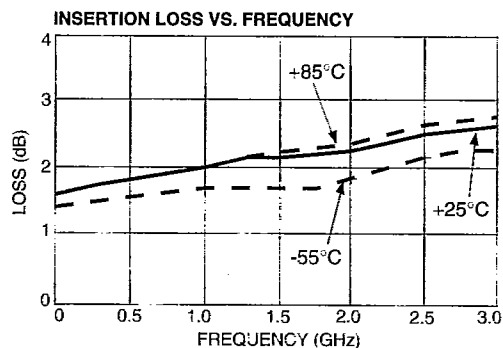
AT-232

Absolute Maximum Ratings

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 – 2.0 GHz	+27 dBm +34 dBm
Control Voltage	+5V, -8.5V
Operating Temperature	-55°C to +125°C
Storage Temperature	-65°C to +150°C

Notes: 1. Operation of this device above any one of these parameters may cause permanent damage.

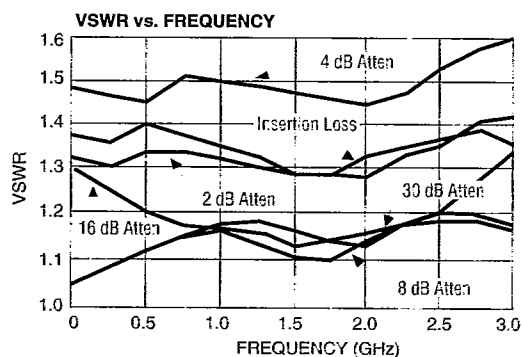
Typical Performance



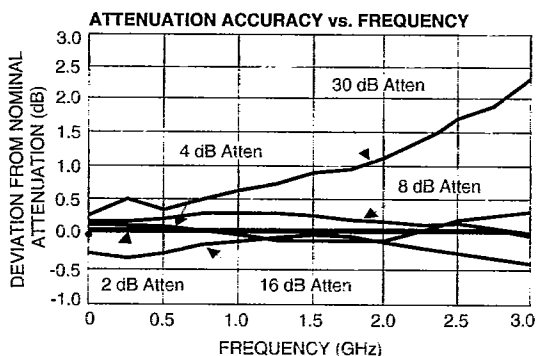
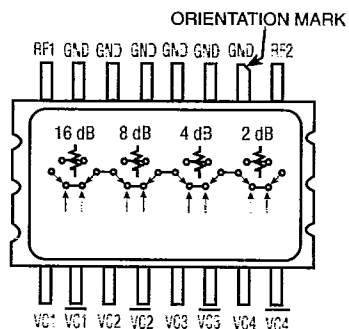
Truth Table

Control Inputs								Attenuation (dB)
VC4	VC4	VC3	VC3	VC2	VC2	VC1	VC1	
1	0	1	0	1	0	1	0	Reference
0	1	1	0	1	0	1	0	2 dB
1	0	0	1	1	0	1	0	4 dB
1	0	1	0	0	1	1	0	8 dB
1	0	1	0	1	0	0	1	16 dB
0	1	0	1	0	1	0	1	30 dB

"0" = Vin Low, Vin Low = 0V, "1" = Vin High, Vin High = -5V



Functional Schematic (Top View)



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